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EXAMINER	
EOM, ROBERT J	

ART UNIT	PAPER NUMBER
1797	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/574,767	FISHER ET AL.	
	Examiner	Art Unit	
	ROBERT EOM	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,10-34,36-42 and 46-59* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,10-34,36-42 and 46-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-45 have been considered but are moot in view of the new ground(s) of rejection.

The applicant has amended independent claim 1 to further define the attribute of the dispersion and the original domain data in a combination not previously presented for consideration upon the merits for patentability.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 2, 10-18, 26-38, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gysling et al. (US 2003/0154036 A1), in view of Gupper et al. (Combined application of imaging methods for the characterization of a polymer blend), in further view of Stark et al. (USP 5,568,400).

Regarding claim 1, Gysling discloses a method for analyzing a dispersion ([0031]) comprising the following steps: (a) collecting a set of original domain data relating to an attribute of the dispersion ([0036]); (b) transforming the set of original domain data into a transformed set of original domain data, wherein the transformed set of original domain data is in the frequency domain ([0037]); and (c) characterizing the dispersion using the transformed set of original domain data ([0038]).

Gysling does not explicitly disclose the set of original domain data is comprised of a transmittance signal representing distribution of transmittance of electromagnetic radiation through the dispersion over a spatial area and that the attribute of the dispersion is transmittance of electromagnetic radiation through the dispersion.

Gupper teaches a method of characterizing a polymer blend through the use of multiple imaging methods, among which is Fourier transform infrared spectroscopy

(pg1517/C1/L1-14), where transmission FT-IR images were collected to provide size and spatial distribution (Fig. 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to obtain spectral data from the transmittance of electromagnetic radiation since the examiner takes Official Notice of the equivalence of transmission data (Stark et al.: C1/L38, see: optical spectrum) and pressure data (Stark et al.:C1/L39, see: vibration/acoustics analysis) for their use in the Fourier transform image analysis art and the selection of these known equivalents to analyze a dispersion would be within the level of ordinary skill in the art.

Regarding claim 2, modified Gysling discloses all of the claim limitations as set forth above. Gysling further discloses generating a frequency domain spectrum from the transformed set of original domain data, wherein the frequency domain spectrum expresses a parameter relating to the attribute of the dispersion as a function of frequency and wherein the characterizing step is performed using the frequency domain spectrum ([0037]).

Regarding claims 10-12, modified Gysling discloses all of the claim limitations as set forth above. Gysling further discloses transforming the set of original domain data in one dimension and conditioning the set of original domain data before the transforming step in order to reduce at least one unwanted component in the set of original domain data by calculating a derivative of the set of original data in one dimension ([0037]).

Regarding claim 13, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses transforming the set of original domain data in two dimensions (Stark: C1/L48-49).

Regarding claims 14 and 15, modified Gysling discloses all of the claim limitations as set forth above. Gysling further discloses conditioning the set of original domain data before the transforming step in order to reduce at least one unwanted component in the set of original domain data by calculating a derivative of the set of original data in two dimensions ([0037]).

Regarding claim 16, modified Gysling discloses all of the claim limitations as set forth above. Gysling further discloses collecting a plurality of subsets of original domain data so that the set of original domain data is comprised of the subsets of original domain data, wherein the subsets of original domain data are transformed into a plurality of subsets of transformed original domain data, and wherein the characterizing step is performed using the subsets of transformed original domain data (Fig. 1, see: $P_1(t) – P_N(t)$).

Regarding claims 17 and 18, modified Gysling discloses all of the claim limitations as set forth above. Gysling further discloses generating a frequency domain spectrum from each of the subsets of transformed original domain data in order to produce a plurality of frequency domain spectra and wherein the characterizing step is performed using the frequency domain spectra, where each of the subsets of original domain data are collected at a different value of a dispersion characterizing variable so

that the dispersion may be characterized with respect to the dispersion characterizing variable (Fig. 1, see: $P_1(\omega) - P_N(\omega)$).

Regarding claims 26-28, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses integrating each of the frequency domain spectra between an upper selected frequency and a lower selected frequency, thereby obtaining a characterization number for each of the frequency domain spectra, further calculating a derivative of the expression of characterization number as a function of the dispersion characterizing variable in order to characterize the dispersion with respect to the dispersion characterizing variable (Stark: C3/L12-35).

Regarding claims 29-31, modified Gysling discloses all of the claim limitations as set forth above. Gysling further discloses transforming the set of original domain data in one dimension and conditioning the set of original domain data before the transforming step in order to reduce at least one unwanted component in the set of original domain data by calculating a derivative of the set of original data in one dimension ([0037]).

Regarding claim 32, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses transforming the set of original domain data in two dimensions (Stark: C1/L48-49).

Regarding claims 33 and 34, modified Gysling discloses all of the claim limitations as set forth above. Gysling further discloses conditioning the set of original domain data before the transforming step in order to reduce at least one unwanted component in the set of original domain data by calculating a derivative of the set of original data in two dimensions ([0037]).

Regarding claims 36-38, modified Gysling discloses all of the claim limitations as set forth above. Gysling further discloses transforming the set of original domain data in one dimension and conditioning the set of original domain data before the transforming step in order to reduce at least one unwanted component in the set of original domain data by calculating a derivative of the set of original data in one dimension ([0037]).

Regarding claim 46, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses that the FTIR imaging in transmission mode can determine the concentration of each component of a sample comprising silicone oil in a polymer blend (Gupper: Fig. 3b) using the Beer-Lambert Law.

6. Claims 19-25 and 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gysling et al. (US 2003/0154036 A1), in view of Gupper et al. (Combined application of imaging methods for the characterization of a polymer blend), in further view of Stark et al. (USP 5,568,400), as applied to claims 1, 2, and 16-18 above, in further view of Coates et al. (US 2002/0185604 A1).

Regarding claims 19-21, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses that the FTIR imaging in transmission mode can determine the concentration of each component of a sample comprising silicone oil in a polymer blend (Gupper: Fig. 3b) using the Beer-Lambert Law.

Modified Gysling does not explicitly disclose the dispersion is comprised of an emulsion comprising oil and water, and wherein the dispersion characterizing variable is time.

Coates teaches a method and apparatus of analyzing lubricant oils and functional fluids (Abstract) through measurement of the transmittance of IR radiation though a flow through assembly to a FTIR spectrometer ([0088]-[0089]) Coates further teaches the dispersion is comprised of an emulsion comprising oil and water ([0007]) and wherein the dispersion characterizing variable is a ratio of the relative amounts of oil and water contained in the emulsion ([0150]) and wherein the dispersion characterizing variable is time ([0088]).

It would have been obvious to one having ordinary sill in the art at the time of the invention to characterize a oil and water emulsion based on a function of time with the method and apparatus of modified Gysling, as taught by Coates, since doing so would provide for a timescale of a continuous analysis of a dispersion as automated data collection occurs.

Regarding claim 22, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses the step of generating from the frequency domain spectra an expression of the parameter relating to the attribute of the dispersion as a function of both frequency and the dispersion characterizing variable in order to characterize the dispersion with respect to the dispersion characterizing variable (Coates: [0145]).

Regarding claims 23-25, modified Gysling discloses all of the claim limitations as set forth above. Gysling further discloses transforming the set of original domain data in one dimension and conditioning the set of original domain data before the transforming

step in order to reduce at least one unwanted component in the set of original domain data by calculating a derivative of the set of original data in one dimension ([0037]).

Regarding claim 39, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses the transforming step is comprised of transforming the set of original domain data in one dimension along a plurality of sample lines (Coates: Fig. 15A-15C).

Regarding claims 40 and 41, modified Gysling discloses all of the claim limitations as set forth above. Gysling further discloses conditioning the set of original domain data before the transforming step in order to reduce at least one unwanted component in the set of original domain data by calculating a derivative of the set of original data in one dimension ([0037]).

Regarding claim 42, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses determining from the plurality of sample lines an average value for the parameter relating to the attribute of the dispersion as a function of frequency (Coates: [0129]).

7. Claims 47-59 rejected under 35 U.S.C. 103(a) as being unpatentable over Gysling et al. (US 2003/0154036 A1), in view of Gupper et al. (Combined application of imaging methods for the characterization of a polymer blend), in further view of Stark et al. (USP 5,568,400), as applied to claims 1, 2, 16-18, and 46 above, in further view of McLean et al. (Comparison of Precipitation and extrography in the fractionation of crude oil residua).

Regarding claim 47, modified Gysling discloses all of the claim limitations as set forth above.

Modified Gysling does not explicitly disclose characterizing the dispersion is comprised of characterizing the dispersion with respect to a stability of the dispersion.

McLean teaches a method of comparison of precipitation and extrography in the fractionation of crude oil residua where FTIR spectroscopy is used to determine the weight fraction of the functional groups to assess the stability of emulsions or sludges which are produced by these crudes in refinery processing (Abstract; pg 574, see: FTIR Spectroscopy).

It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize FTIR spectroscopy data to assess a stability of a dispersion in the method and apparatus of modified Gysling, as taught by McLean, since doing so provides insight into the mechanisms which govern the stability of emulsions produced from crude oils (McLean: pg 585, see: Conclusions).

Regarding claim 48, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses the dispersion is comprised of crude oil (McLean: pg 571/C2/L18), asphaltene particles (McLean: pg 571/C2/L18), and a solvent (McLean: pg 571/C1/L20).

Regarding claim 49, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses the dispersion exhibits a formation of a second liquid phase ad wherein characterizing the dispersion is comprised of

characterizing the dispersion with respect to the formation of the second liquid phase (McLean: pg 573, see: Extrographic Separation of Crude Oil).

Regarding claims 50-52, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses the asphaltene particles exhibit a plurality of stages of separation from the dispersion with respect to the stages of particles from the dispersion (McLean: pg 574, see: Figure 1) and to the onset of precipitation of the asphaltene particles from the dispersion (McLean: pg 573, see: Asphaltene Precipitation and Resin Isolation).

Regarding claim 53, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses the dispersion characterizing variable is selected from a group of dispersion characterizing variables consisting of composition of the dispersion, temperature, pressure, and combination thereof, and wherein composition of the dispersion is comprised of concentration of the solvent in the dispersion (McLean: pg 574, see: FTIR Spectroscopy).

Regarding claim 54, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses the solvent is selected from a group of solvents consisting of ethane, propane, butane, pentane and carbon dioxide (McLean: pg 571/C1/L20).

8. Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gysling et al. (US 2003/0154036 A1), in view of Gupper et al. (Combined application of imaging methods for the characterization of a polymer blend), Stark et al. (USP 5,568,400), and

McLean et al. (Comparison of precipitation and extrography in the fractionation of crude oil residua), as applied to claims 1, 2, 16-18, and 46-48, 50, and 52 above, in further view of Liu et al. (Phase equilibria of the CO_2-Jiangsu crude oil system and precipitation of heavy components induced by supercritical CO_2).

Regarding claim 54, modified Gysling discloses all of the claim limitations as set forth above.

Modified Gysling does not explicitly disclose the solvent being carbon dioxide.

Liu teaches the use of supercritical CO_2 to precipitate heavy components such as asphaltenes (pg 27, see: Introduction).

It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize supercritical CO_2 as the solvent used to precipitate asphaltenes in the method and apparatus of modified Gysling, as taught by Liu, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416. In this particular instance, supercritical CO_2 can extract components with a molecular weight as high as 400 g/mol (Liu: pg 31/C1/L10-12).

9. Claims 56-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gysling et al. (US 2003/0154036 A1), in view of Gupper et al. (Combined application of imaging methods for the characterization of a polymer blend), Stark et al. (USP 5,568,400), and McLean et al. (Comparison of precipitation and extrography in the

fractionation of crude oil residua), as applied to claims 1, 2, 16-18, and 46 above, in further view of Coates et al. (US 2002/0185604 A1).

Regarding claim 56, modified Gysling discloses all of the claim limitations as set forth above.

Modified Gysling does not explicitly disclose the dispersion comprising an emulsion of oil and water.

Coates teaches a method and apparatus of analyzing lubricant oils and functional fluids (Abstract) through measurement of the transmittance of IR radiation though a flow through assembly to a FTIR spectrometer ([0088]-[0089]). Coates further teaches the dispersion is comprised of an emulsion comprising oil and water ([0007]).

It would have been obvious to one having ordinary skill in the art at the time of the invention to characterize an oil and water emulsion with the method and apparatus of modified Gysling, as taught by Coates, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Regarding claim 57, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses characterizing the dispersion is comprised of characterizing the dispersion with respect to a stability of the dispersion (McLean: Abstract; pg 574, see: FTIR Spectroscopy).

Regarding claim 58, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses the dispersion exhibits drying properties and wherein characterizing the dispersion is comprised of characterizing the dispersion

with respect to the drying properties of the dispersion (McLean: pg 573, see: Extrographic Separation of Crude Oil and Asphaltene Precipitation and Resin Isolation).

Regarding claim 59, modified Gysling discloses all of the claim limitations as set forth above. Modified Gysling further discloses the dispersion characterizing variable is time (Coates: [0088]).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sjoblom et al. (Our current understanding of water-in-crude oil emulsions. Recent characterization techniques and high pressure performance).

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT EOM whose telephone number is (571)270-7075. The examiner can normally be reached on Mon.-Thur., 9:00am-5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/
Primary Examiner, Art Unit 1797

/R. E./
Examiner, Art Unit 1797